Pacific and northern Plains States and from the Great Lakes southward and southeastward.

The precipitation for the month as a whole was quite generally below the average, except in the western portions of Washington and Oregon, southern Idaho, most of New York, New Jersey, and the New England States. In much of Texas, eastern Colorado, and New Mexico either no precipitation or only a trace occurred; and throughout most of the remainder of the western Plains States and eastern Rocky Mountain slope the precipitation was less than half an inch.

Snowfall.—There was a good snow cover in the extreme Northern States throughout most of the month, but in much of the winter-wheat belt there was little snow covering and some damage resulted. In the extreme Northwestern States unusually heavy snows occurred, and at the close of the month large quantities had accumulated in the higher mountain regions; thus prospects of a plentiful supply of water for the coming growing season were good in nearly all portions of the western mountain regions.

GENERAL SUMMARY.

The weather for the month was generally favorable for outdoor operations in most of the Southern States, but in the North it was generally cold and disagreeable. The cold weather about the middle of the month did some damage to truck in the South and to citrus bloom in northern Florida.

The weather was favorable for a good ice harvest of excellent quality in the northeastern States, but farther south the amount harvested during the winter is, on the average, less than will be required. The month closed with most of the Great Lakes harbors covered with ice. On the Mississippi and Missouri Rivers and their tributaries, however, but little ice remained except in the northern portions. Truck plantings in the South were generally later than usual, and in the lower Mississippi Valley farm operations were delayed by floods.

Average accumulated departures for February, 1916.

Districts.	Temperature.			Precipitation.			Cloudiness.		Relative humidity.	
	General mean for the current month.	Departure for the current month.	Accumulated departure since Jan. 1.	General mean for the current month.	Departure for the current month.	Accumulated departure since Jan. 1.	General mean for the current month.	Departure from the normal.	General mean for the current month.	Departure from the normal.
	°F.	°F.	°F.	Ins.	Ins.	Ins.	Per ct.		Per ct.	
New England	22.6	−3.1	+ 1.7	4.11	+0.70	−1.30	6.6	+1.3	76	+ 1
Middle Atlantic	31.2	−1.7	+ 4.7	3.54	+0.20	−1.30	6.4	+0.9	71	− 3
South Atlantic	48.1	+0.4	+ 8.0	3.26	−0.90	−3.20	4.1	−1.2	72	− 4
Florida Peninsula	65.7	−1.2	+ 5.2	1.65	−1.00	−2.70	3.5	−0.8	76	− 4
East Gulf	49.7	−1.1	+ 6.4	2.96	−2.00	−3.30	4.5	−1.1	70	− 6
West Gulf	51.2	+1.5	+ 6.4	0.56	−2.30	−0.50	4.6	−1.0	69	− 5
Ohio Valley and Tennessee	33.1	−2.6	+ 4.1	2.26	−1.30	+1.00	6.5	+0.3	75	+ 1
Lower Lakes	20.3	−4.3	+ 2.8	2.47	−0.10	+0.20	7.3	+0.5	81	+ 1
Upper Lakes	16.1	−3.0	+ 0.3	0.82	−1.00	+0.20	7.5	+1.2	81	− 1
North Dakota	6.8	−0.2	−10.2	0.40	−0.20	+0.20	4.2	−0.8	85	+ 5
Upper Mississippi Valley	23.0	−1.6	+ 1.2	0.66	−1.10	+1.70	5.7	+0.5	80	+ 3
Missouri Valley	25.0	+0.6	− 2.5	0.49	−0.60	−1.80	4.7	−0.5	81	+ 6
Northern slope	23.9	+2.4	−10.9	0.59	−0.20	+0.30	5.1	0.0	72	+ 1
Middle slope	34.7	+2.3	− 0.8	0.17	−0.60	+0.20	3.8	−0.6	68	+ 1
Southern slope	50.1	+4.6	+ 7.6	0.01	−0.90	−1.10	3.2	−1.6	48	−14
Southern Plateau	46.8	+1.9	+ 0.6	0.18	−0.50	+1.80	3.0	−0.6	47	+ 3
Middle Plateau	36.5	+3.5	− 0.7	0.74	−0.40	+1.50	5.2	+0.1	72	+ 8
Northern Plateau	33.9	+1.8	− 7.1	2.26	+0.80	+1.10	6.8	+0.6	77	+ 2
North Pacific	43.8	+2.5	− 5.0	8.06	+2.20	+1.20	6.7	−0.4	83	+ 2
Middle Pacific	52.9	+3.9	− 0.2	3.31	−1.10	+5.10	6.3	+0.7	79	+ 3
South Pacific	56.6	+4.0	− 2.2	1.63	−0.90	+7.40	5.1	+0.8	76	+ 7

WEATHER CONDITIONS IN THE NORTH ATLANTIC DURING FEBRUARY, 1915.

The data presented are for February, 1915, and comparison and study of the same should be in connection with those appearing in the REVIEW for that month. Chart IX (XLIV–20) shows for February, 1915, the averages of pressure, temperature, and the prevailing direction of the wind at Greenwich mean noon, together with the locations and courses of the more severe storms of the month.

PRESSURE.

The mean atmospheric pressure for the month was in many respects considerably different from the normal as shown on the Meteorological Chart of the North Atlantic for February. The Azores high was about 10 degrees east of its usual position, but was of normal intensity. Two highs were located in the eastern part of the United States, the first with a crest of 30.15 inches central near Charlotte, N. C., the eastern boundary extending along the coast from New York to northern Florida. The second high, of limited extent and the same intensity, was central in northern New York, separated from the first by a slight depression. The greatest difference in the pressure conditions from the normal is shown in the position of the Icelandic low of 29.4 inches central near latitude 58° N., longitude 10° W., where the normal pressure is 29.7 inches and about 10 degrees southeast of its usual location.

STORMS.

The large difference in pressure and comparatively short distance between the Azores high and the Icelandic low were responsible for the unusual number of gales on that part of the ocean between the two great centers of action. In the waters west of the 50th meridian, the number of gales was, as a rule, above the normal, but in others the number was below. The month was noted for the large differences in general conditions between the first and last periods. A good example of this may be shown in the 5-degree square between the 45—50th parallels and the 10—15th meridians, where the normal percentage of gales of 48 miles per hour and over is 18. For February, 1915, gales were observed in this square on 14 days, a percentage of 50. Nine of these gales occurred in the first decade of the month, four in the second, and only one in the last eight days. In the waters adjacent to the American coast the number of gales was somewhat above the normal, and they were as a rule fairly well distributed throughout the month, although between the 30—40th parallels and west of the 60th meridian, where the percentage ranged from 11 to 29, they all occurred after the 16th.

Three storm tracks are shown on Chart IX, although there were a number of disturbances whose courses were either too irregular to chart or it was impossible to plot their positions accurately on account of lack of observations.

On February 1 a low (1 on Chart IX) was central near latitude 53° N., longitude 30° W. There were but few observations received north of the center and the heaviest winds evidently prevailed in the southwest quadrant, where several vessels reported west and northwest gales of from 50 to 75 miles per hour, with snow and hail. It then moved a short distance in a southwesterly direction, and on the 2d was near latitude 50°, longitude 33°. The steamship *Pretorian* (Brit.), about 5 degrees south of the center, reported a barometer reading of 27.83 inches, and the steamship *Oosterdyk* (Dtch.), near by at the time, one of

27.96 inches. These were among the lowest barometer readings received in this office for years, and as both vessels were equipped with mercurial barometers, recently compared, the readings may be considered comparatively reliable. The following data were taken from the storm log of the *Pretorian* for February 2, her position for the period from 8 a. m. to 2 p. m. (local time) being given as latitude 49° 39′ N., longitude 34° 15′ W.:

Time.	Wind.		Barometer.
	Direction.	Force per hour.	
		Miles.	*Inches.*
8 a. m.	se.	56	28.25
10 a. m.	s.	48	27.95
11 a. m.	sw.	56	27.85
Noon.	w-nw.	28	27.79
2 p. m.	nw.	90	28.07

Barometer readings were corrected and reduced to sea level.

From the above it can be seen that the *Pretorian* was near the center of the storm at noon when the velocity of the wind and the barometer reading were both at their minimum.

This storm covered a large area and winds of hurricane force prevailed between the 15–50th meridians along the northern trans-Atlantic sailing routes. From its position on the 2d, the storm curved toward the north, and on the 3d the approximate position of its center was at latitude 57°, longitude 19°, although it was impossible to plot it accurately on account of lack of observations. The barometer had risen slightly, although the wind still retained its high velocity, and the storm area was nearly as large as on the previous day. The steamer *Texas* (Swed.) reported a northeasterly hurricane of 90 miles per hour near latitude 57° N., longitude 20° W., and a number of other vessels encountered winds of extremely high velocity, with hail and snow.

On the 15th there was a low (II on Chart IX) of 29.50 inches near latitude 51° N., longitude 40° W. The winds were moderate near its center, although in the vicinity of latitude 45°, longitude 42°, several vessels encountered west and northwest gales of from 40 to 50 miles per hour, with hail and snow. This disturbance moved in an easterly direction and on the 16th was near latitude 51°, longitude 25°. The barometer had fallen to 29.14 inches, and the winds increased in velocity, being especially strong in the southwest quadrant where the steamer *Idaho* (Brit.), at latitude 46° N., longitude 39° W., reported a northwest wind of 90 miles per hour, with hail and snow. The storm then increased its rate of translation and turning to the northeast was near latitude 56° N., longitude 13° W. on the 17th. Heavy winds prevailed over a large area, although the maximum velocity of 60 miles per hour was somewhat less than on the day before. After the 17th the movement of the storm was slow, and on the 18th it was central near latitude 58° N., longitude 10° W.; the winds in the southwest quadrant continued to decrease in violence, although gales of from 40 to 55 miles per hour were still encountered. The low continued its slow eastward movement, and on the 19th the center was off the north coast of Scotland. The winds as a rule were moderate, though four vessels in a small area near latitude 45°, longitude 21° W., reported gales of from 40 to 55 miles. The storm then curved slightly to the north and on the 20th the center was near Sumburgh Head, the most southerly point of the Shetland Islands. Winds of high velocities covering a slightly larger territory than on the previous day prevailed, accompanied by hail and snow, between the 45–50th parallels and the 10–20th meridians. This low remained nearly stationary for the next two days, and on the 23d was fast filling in.

On the 18th a low (III on Chart IX) appeared near latitude 31° and longitude 71°. This caused heavy north and northeast winds along the American coast between Norfolk and Jacksonville, three vessels reporting velocities of more than 60 miles, with hail and snow. The disturbance moved rapidly in an easterly direction and on the 19th was near latitude 36°, longitude 62°. In spite of this easterly movement, heavy gales still prevailed along the coast, covering slightly more territory than on the day before. On the 20th the low was near latitude 36°, longitude 59°, the barometer reading 29.57 inches. The difference in pressure between this point and the American coast was very large and several vessels reported strong northeast gales, with hail and snow. The low then turned sharply toward the north, and on the 21st was near latitude 39°, longitude 56°, heavy gales between this point and the coast still continuing. The disturbance recurved toward south, and on the 22d was about 3 degrees east of its position on the 20th. The winds along the coast moderated considerably, although gales were still encountered near the center and a short distance to the north of it. The storm then moved in a nearly due easterly course with a comparatively uniform rate of speed, and on the 23d was near latitude 35°, longitude 53°, the area being less in extent, only one vessel reporting winds of over 50 miles. On the 24th the low was near latitude 35°, longitude 47°, and while the territory with heavy winds was small, two vessels near the center encountered gales of from 50 to 75 miles. The steamer *Ikbal* (Brit.) in her storm log reported a barometer reading of 29.01 inches at 3 a. m. (local time) on February 24, her position being given as latitude 35° 40′, longitude 49° 18′. The low continued in its easterly movement, and on the 25th was near latitude 35°, longitude 42°. The barometer had risen since the previous day and the winds decreased in force, the maximum velocities reported being from 40 to 50 miles. From this point the disturbance began to lose force and on the 26th was central near latitude 35°, longitude 37°, but the winds had decreased and the barometer risen, the low rapidly filling in, so that no trace of it could be seen on the 27th. This track was remarkable for the fact that it was unusually far south, and the normal condition of high pressure in the vicinity of the Azores and the Bermudas was completely reversed for several days, causing storms of unusual violence for the locality.

TEMPERATURE.

The temperatures between the 10—40th meridians were, as a rule, not far from the normal, as the departures ranged from −1° to +3° in this area, while in the waters adjacent to the European coast they varied from −1° between the 55—60th parallels to +5° off the coast of Portugal. Between the 45—50th parallels and the 40—50th meridians the temperatures were slightly below the normal, increasing to the southward and westward. The highest positive departure was 8°, and occurred in the 5-degree square between the 35—40th parallels and the 60—65th meridians, while in the Gulf of Mexico the departures ranged from 0° to −4°. The temperature departure at a number of the Weather Bureau stations on the Atlantic and Gulf coasts were as follows: Eastport, +6.2°; Portland, +4.6°; Boston, +4.2°; Nantucket,

+2.4°; New York, +4.5°; Washington, +4.3°; Norfolk, +5.6°; Hatteras, +1.2°; Charleston, −0.2°; Key West, −2.4°; Tampa, −0.6°; Pensacola, −2.1°; and New Orleans, −0.1°. The lowest temperature reported during the month was −15° and occurred on the 2d and 4th in the Gulf of St. Lawrence and the waters to the northeast of it. Away from the influence of the shore the lowest temperature recorded was 5° on February 4 in the 5-degree square between the 50—55th parallels and the 45—50th meridians. The highest temperature was 82° and occurred on the 26th in the waters adjacent to the Panama Canal Zone.

FOG.

There was less fog than usual during the month off the Banks of Newfoundland, where the normal percentage of days with fog is 30 or more. In February, 1915, fog was observed in that locality on 5 days, a percentage of 18. On the other hand, in the area between the 45—50th parallels and the 30—35th meridians—where the normal percentage is less than 5—in the month under discussion it was observed on 4 days, or a percentage of 14. No fog was reported along the American coast south of the 45th parallel and the same conditions prevailed in the waters adjacent to the European coast north of that line. In the 5-degree square between the 40—45th parallels and the 15—20th meridians fog was observed on 3 days during the latter part of the month, a percentage of 11, while the normal for the same square varies from less than 5 to 5 or slightly more.

PRECIPITATION.

Hail was reported on 10 days and snow on 11 on the northern trans-Atlantic steamer routes, most of it occurring before February 20.

Maximum wind velocities, February, 1916.

Stations.	Date.	Velocity.	Directions.	Stations.	Date.	Velocity.	Directions.
		Mls./hr.				*Mls./hr.*	
Atlanta, Ga.	13	50	nw.	North Head, Wash	13	54	se.
Block Island, R. I.	7	64	w.	Do.	28	54	nw.
Do.	19	72	nw.	Point Reyes Light, Cal.	4	55	s.
Do.	27	58	nw.	Do.	29	52	nw.
Do.	28	60	nw.	Providence, R. I.	7	50	nw.
Buffalo, N. Y.	4	51	w.	Do.	19	60	w.
Do.	7	70	w.	Do.	28	65	w.
Cheyenne, Wyo.	7	60	w.	Sandy Hook, N. J.	7	58	w.
Hatteras, N. C.	14	54	n.	Do.	19	63	w.
Do.	19	51	nw.	Do.	21	50	nw.
Jacksonville, Fla.	25	50	w.	Do.	27	58	w.
Lander, Wyo.	7	56	w.	Do.	28	50	w.
Mt. Tamalpais, Cal.	4	53	s.	Syracuse, N. Y.	18	52	nw.
Do.	9	56	s.	Tatoosh Island, Wash.	1	58	e.
Do.	10	60	s.	Do.	2	88	ne.
Do.	29	53	sw.	Do.	3	61	e.
New York, N. Y.	7	65	w.	Do.	8	55	e.
Do.	18	53	nw.	Do.	9	52	s.
Do.	19	64	nw.	Do.	10	62	s.
Do.	26	60	nw.	Do.	13	56	s.
Do.	27	75	nw.	Do.	17	62	e.
Do.	28	62	nw.	Do.	28	58	w.
Norfolk, Va.	19	50	nw.	Seattle, Wash.	10	54	sw.
North Head, Wash.	2	54	s.	Trenton, N. J.	19	54	nw.
Do.	7	50	sw.	Do.	27	50	nw.
Do.	9	62	s.				
Do.	10	60	sw.				